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TESTS WITH POISONED BAITS AND ATTRACTANTS FOR
MOTHS OF THE TOBACCO AND TOMATO HORNWORMS

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Prior to the development of arsenical dusts for the control of the tobacco hornworm, Protoparce sexta (Johan.), and the tomato hornworm, P. quinquemaculata (Haw.), on tobacco, partial control was obtained by placing poisoned syrup in newly opened blossoms of the jimsonweed, Datura stramonium L., a preferred feeding plant of the moths. This method was moderately effective, but it necessitated treating newly opened blooms each evening. Later, attempts were made to obtain the odorous principle of jimsonweed blossoms by distillation, extraction, and enfleurage, but with little or no success (3). Many chemicals were tested in an effort to discover a substitute for the natural fragrance of jimsonweed blooms, and several, including benzyl benzoate and iso-amyl benzoate, were attractive. Later, amyl salicylate (probably iso-amyl salicylate) produced a marked feeding response.

Moths attracted to the artificial odors were captured readily in traps (2) or induced to take poisoned baits from simulated jimsonweed blooms, known as poison feeders (1). Laboratory tests with many poisons indicated that most of them were palatable to the moths but that they killed too slowly or not at all. A 5-percent solution of tartar emetic in sweetened water was found to be effective and was used for a number of years.

The authors continued these investigations and developed a safe and fairly effective bait containing 0.04 percent of rotenone (from an aqueous extract of derris or cube) and 10 percent by weight of sugar in water. Large field experiments conducted in Tennessee in 1941 and 1942 (4) demonstrated that moths attracted to iso-amyl salicylate may be trapped or poisoned in large numbers. Traps and feeders containing poisoned bait, when placed at strategic points distributed over square-mile areas in 1942 and 1943, materially reduced the hornworm infestation in fields of burley and dark fire-cured tobacco, and their use demonstrated that either of these methods is of value as a supplementary control.

The results of tests with different poisons and attractants for hornworms during these investigations are presented herein. These tests were made at Clarksville, Tenn., 1937-45.

The poisons were tested in a cloth-covered cage approximately 70 feet long, 35 feet wide, and 8 feet high, divided into six equal sections. A poison feeder and a means of diffusing the odor of iso-amyl salicylate were mounted on top of a 3-foot stake in the center of each compartment. All baits were liquid and contained 10 percent by weight of cane sugar in water.

The aromatic materials were tested under field conditions in traps, each equipped with two poison feeders for the visual attraction of moths and with two 1-inch vials of the material to be tested. The odors of the materials were diffused from wicks extending into the liquids and protruding 1 inch above the top of the vials. The wicks were held in position by loose-fitting corks. Each treatment was replicated three times. Iso-amyl salicylate was purchased from several dealers, but none of the tested brands proved to be outstandingly superior to the others. Materials that attracted very few or no moths in several days were discarded, whereas those that showed promise were tested for comparatively long periods. The variation in effectiveness of a material, as shown by the results of several tests, is attributed to changing weather conditions and fluctuations in the moth population.

Table 1 lists the poisons that were tested and gives the mortalities of moths after 12 and 18 hours. The tests that were made at the same time were grouped, as they are more comparable than tests made at different times.

Cube extracts prepared by the authors to contain an undetermined percentage of rotenone are referred to as mixtures of cube with water or other materials. The strengths of the baits containing these extracts are given as ratios of mixtures in column 1 to additional water prior to the addition of sugar. These extracts were prepared from ground cube root containing 4.28 percent of rotenone and were filtered before use. Such expressions as "rotenone in water (extract)" refer to extracts of cube or derris prepared either by the Division of Insecticide Investigations or under its instruction to contain a known percentage of rotenone. It is recognized that these extracts contained other extractives than rotenone that may have been of value. These extracts were diluted on the basis of rotenone content, and the percentages of rotenone in the liquids before the addition of sugar are given in column 2. The preparation referred to as "rotenone (pure) in 95 percent ethyl alcohol" was prepared by mixing an excess quantity of pure rotenone crystals with 95 percent ethyl alcohol. The rotenone crystals that did not dissolve were discarded.

The results in table 1 show that rotenone is very little, if any, more toxic than tartar emetic to the moths. The use of rotenone is safer, however, since tartar emetic is very toxic to warm-blooded animals.

Table 2 lists the materials tested, and gives the number of moths caught within the indicated number of days. About half of approximately 100 materials tested were attractive, but none were more attractive than iso-amyl salicylate.

Literature Cited

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Table 1.--Effectiveness of different materials as poisons in sweet-water baits in cage tests against the moths of the tobacco hornworm and the tomato hornworm

Material tested in water with 10 gm. of sugar added to each 100 ml. of liquid	Percent of ac- tive ingredient or ratio of mix- ture with water	Number of moths	Percent mortality	
			After 12 hours	After 18 hours
Cobalt nitrate	5	7	0	0
Paregoric	5	7	0	0
Tartar emetic (check)	5	7	0	43
Tartar emetic	5	10	20	70
Indian hemp (<u>Cannabis sativa</u>) flowering tips, alcohol extract	1:19	10	0	0
Sugar solution (check)	----	10	0	0
Paris green	5	12	16	42
Potassium fluoaluminate	5	12	8	33
Magnesium sulfate	5	12	0	0
Sugar solution (check)	----	12	0	0
Cobalt nitrate	5	25	0	4
Arsenic sulfide	5	25	0	0
Antimony arsenate	5	25	0	4
Sugar solution (check)	----	25	4	4
Arsenious oxide	5	20	55	55
Antimony oxide	5	20	5	10
Aluminum arsenate	5	20	10	60
Sugar solution (check)	----	20	15	25
Sodium fluoride	5	10	10	10
Aluminum arsenate	5	10	0	0
Arsenious oxide	5	10	20	30
Sugar solution (check)	----	10	0	0
Barium carbonate	5	9	11	22
Barium chloride	5	9	0	11
Barium nitrate	5	9	22	22
Sugar solution (check)	----	9	0	0
Cobalt nitrate	5	15	0	0
Cobaltous chloride	5	15	0	0
Cobaltous oxalate	5	15	0	0
Sugar solution (check)	----	15	0	0

Table 1.--(Continued)

Material tested in water with 10 gm. of sugar added to each 100 ml. of liquid	Percent of ac- tive ingredient or ratio of mix- ture with water	Number of moths	Percent mortality	
			After 12 hours	After 18 hours
Cobaltous chromate	5	20	0	0
Trichloro-tert-butyl alcohol	5	20	0	0
Caffeine arsenite	5	20	0	0
Sugar solution (check)	---	20	0	0
Cube 4 oz., 95% ethyl alcohol 8 oz.	1:12 1:6	80 80	34 30	64 49
Tartar emetic	5	80	22	56
Sugar solution (check)	---	30	7	15
Cube 1 oz., chloroform 3 oz.	1:8	30	10	23
Cube 1 oz., methyl alcohol 3 oz.	1:8	30	37	53
Cube 1 oz., ethyl alcohol 3 oz.	1:8	30	37	60
Tartar emetic (check)	5	30	27	37
Rotenone (pure) in 95% ethyl alcohol (saturated solution)	1:79 1:59 1:47	30 30 30	17 7 17	40 30 40
Tartar emetic (check)	5	30	37	60
Rotenone in methyl alcohol (extract)	.05 .04 .03 .02	20 20 40 48	25 35 23 27	55 65 58 52
Rotenone in water (extract) plus .5% sodium benzoate	.7 .4 .2	13 13 13	31 31 38	31 38 54
Sugar solution (check)	---	13	0	8
Rotenone in water extract of derris plus .2% of formaldehyde	.7 .4 .2	20 20 20	40 65 35	45 75 75
Sugar solution (check)	---	20	0	10
Cube 6 oz. in water 64 oz., plus .5% of sodium benzoate	3:1 1:1 1:3	15 15 15	13 0 0	20 33 47
Tartar emetic (check)	5	15	13	33

Table 1.--(Continued)

Material tested in water with 10 gm. of sugar added to each 100 ml. of liquid	Percent of ac- tive ingredient or ratio of mix- ture with water	Number of moths	Percent mortality	
			After 12 hours	After 18 hours
Cube 6 oz. in water 64 oz., plus .5% sodium benzoate	1:3 1:7 1:15	15 15 15	0 20 7	13 40 13
Tartar emetic (check)	5	15	33	33
Rotenone in water (extract) plus:				
Sodium benzoate .5%	.34	63	13	38
Formaldehyde .2%	.34	63	33	55
Cube 6 oz., water 32 oz.:				
Without preservative	1:1	63	3	16
Plus sodium benzoate 1%	1:1	63	11	22
Cube 6 oz. in water 64 oz., plus 7% of sodium benzoate -- exposed to sun for 6 days before test	3:1 1:1 1:3	25 25 25	20 24 0	36 68 4
Tartar emetic (check)	5	25	44	64
Mayapple (<u>Podophyllum peltatum</u>) root, alcohol extract	1:9	15	13	33
Fokeberry (<u>Phytolacca americana</u>) root, alcohol extract	1:9	15	13	40
Copper sulfate	5	15	13	33
Tartar emetic (check)	5	15	33	60
Mayapple root, alcohol extract	3:20 1:20 1:10	20 20 20	10 25 30	-- -- --
Tartar emetic (check)	5	20	45	--
Poison hemlock (<u>Conium maculatum</u>) seeds, extract	1:20 1:10 2:10	15 15 15	27 20 33	27 20 33
Tartar emetic (check)	5	15	60	67
<u>Phellodendron amurense</u> seeds, petroleum ether extract	1:20	8	0	0
Horsechestnut (<u>Aesculus</u> <u>hippocastanum</u>) bark, extract	1:10	8	0	0
Larkspur (<u>Delphinium consolida</u>) seeds, extract	1:10	8	0	0
Tartar emetic (check)	5	8	37	37

Table 1.--(Continued)

Material tested in water with 10 gm. of sugar added to each 100 ml. of liquid	Percent of ac- tive ingredient or ratio of mix- ture with water	Number of moths	Percent mortality	
			After 12 hours	After 18 hours
Red squill (<u>Urginea maritima</u>) root, powdered	5 10	25 25	12 24	32 36
Sugar solution (check)	---	25	4	24
"Cobalt poison" or "flystone" 1/	7 3.5	15 15	53 20	80 73
"Cobalt poison" as above, in alcohol	Undiluted	15	20	53
Tartar emetic (check)	5	15	47	73
"Cobalt poison" as above	5	10	0	0
Cobalt arsenate	5	10	30	30
Cobalt arsenite	5	10	0	20
Tartar emetic (check)	5	10	70	70
Sodium fluoaluminate	4.4	18	17	28
Sugar solution (check)	---	18	1	2
Red squill root, powdered	5 10	10 10	10 20	10 30
Sugar solution (check)	---	10	10	20
Cube 100 gm., warm water 100 ml.	Undiluted 3:1 1:1	25 25 25	48 64 32	76 80 60
Tartar emetic (check)	5	25	20	68
Cube 100 gm., warm water 100 ml.	1:3 1:6 1:9	10 10 10	40 20 10	80 70 60
Tartar emetic (check)	5	10	40	80
Sodium iodate	5	45	20	42
Sodium arsenate	2	45	29	55
Rotenone in water (extract)	.05 .03	45 45	24 27	51 55
Tartar emetic (check)	5	45	24	49

Table 1.--(Continued)

Material tested in water with 10 gm. of sugar added to each 100 ml. of liquid	Percent of ac- tive ingredient or ratio of mix- ture with water	Number of moths	Percent mortality	
			After 12 hours	After 18 hours
Nicotine salicylate	2.5	25	4	16
	1	25	32	40
Rotenone in water (extract)	.05	25	36	48
Sugar solution (check)	---	25	16	16
Nicotine salicylate	1	35	11	14
	.5	35	26	43
Rotenone in water (extract)	.05	35	17	23
Sugar solution (check)	---	35	9	11
Rotenone in water (extract)	.03	25	28	64
	.05	25	16	32
Rotenone in water (extract):				
Exposed to sun 8 days	.03	50	10	26
	.05	50	8	20
Not exposed to sun	.03	50	26	32
	.05	50	18	42
Exposed to sun 7 days	.04	50	18	54
Exposed in shade 7 days	.04	50	6	16
Pyrethrins in alcohol extract of pyrethrum	.02	55	2	4
	.04	55	7	11
	.08	55	5	20
	.16	55	7	20
	.32	55	24	29
	.64	55	16	27
Rotenone in water extract of derris	.02	90	---	35
	.04	90	---	59
	.06	90	---	51
	.12	90	---	69
	.16	90	---	65
	.20	90	---	50
Sodium iodate	5	45	20	42
Sodium arsenite	2	45	29	55
Rotenone in water (extract)	.05	45	24	51
	.03	45	27	55
Tartar emetic (check)	5	45	24	49

Table 1.--(Continued)

Material tested in water with 10 gm. of sugar added to each 100 ml. of liquid	Percent of ac- tive ingredient or ratio of mix- ture with water	Number of moths	Percent mortality	
			After 12 hours	After 18 hours
Rotenone in water (extract) plus	0.04	140	--	55
.5% of sodium benzoate	.06	140	--	39
Rotenone in water (extract)	.04	140	--	46
	.06	140	--	44
Rotenone in water (extract) plus tartar emetic:				
Rotenone .04%, tartar emetic 5%	--	140	--	51
Rotenone .06%, tartar emetic 5%	--	140	--	38
Rotenone in water (extract) plus	.02	40	--	47
.5% of sodium benzoate	.04	40	--	45
	.06	40	--	60
	.12	40	--	40
	.20	40	--	40
	.40	40	--	35
Nicotine salicylate	2.5	25	4	16
	1	25	32	40
Rotenone in water (extract)	.04	25	36	48
Sugar solution (check)	--	25	16	16
Nicotine salicylate	1	35	11	14
	.5	35	26	43
Rotenone in water (extract)	.04	35	17	23
Sugar solution (check)	---	35	8	11
Water	---	35	8	17
Picrotoxin	.2	25	4	4
Acetone semicarbazone	1	25	8	8
gamma, gamma-Dipyridyl	.4	25	0	0
Hydroxylamine hydrochloride	1	25	8	8
Semicarbazide hydrochloride	1	25	0	0
p-Nitrophenol	.2	25	0	0
Ammonium fluoride	5	30	13	20
	10	30	17	27
Potassium iodate	5	30	3	3
	10	30	17	30
Tartar emetic (check)	5	30	20	43

Table 1.--(Continued)

Material tested in water with 10 gm. of sugar added to each 100 ml. of liquid	Percent of ac- tive ingredient or ratio of mix- ture with water	Number of moths	Percent mortality	
			After 12 hours	After 18 hours
Rotenone in water (extract)	0.02	30	33	47
Potassium fluoride	5	30	3	17
	10	30	7	23
Ferric chloride	5	30	7	7
	10	30	7	7
Rotenone in water (extract)	.02	30	27	40
Tartar emetic (check)	5	30	20	40
Red squill powder	5	40	10	15
	10	40	17	27
Barium chloride	5	40	10	12
Sodium arsenate	5	40	22	37
Rotenone in water (extract)	.05	40	52	60
Tartar emetic (check)	5	40	40	50
Potassium salicylate	5	25	0	8
	10	25	0	4
Sodium salicylate	5	25	0	4
	10	25	4	32
Rotenone in water (extract)	.02	25	24	64
Tartar emetic (check)	5	25	8	24
2,3,4,6-Tetramethylglucose	1	80	5	10
	2	80	34	51
	4	80	15	46
Sugar solution (check)	---	80	16	31
2,3,4,6-Tetramethylglucose	6	30	20	30
Nicotine peat	5	30	10	27
Tartar emetic	5	30	27	47
Sugar solution (check)	---	30	7	7
Turkey mullein (<u>Piscaria sitigera</u>)	1:50	10	--	40
leaves, water extract	2:50	10	--	30
	4:50	10	--	30
	8:50	10	--	40
	16:50	10	--	80
	32:50	10	--	10

Table 1.--(Continued)

Material tested in water with 10 gm. of sugar added to each 100 ml. of liquid	Percent of ac- tive ingredient or ratio of mix- ture with water	Number of moths	Percent mortality	
			After 12 hours	After 18 hours
2,3,4,6-Tetramethylglucose:				
Chemically pure	2	20	25	35
Crude syrup obtained from manu- facture of pure material	1:24	20	30	60
Partially methylated "glucose" mixture	1:24	20	40	50
Rotenone in water (extract)(check)	.04	20	45	85
DDT 10% in cellosolve	1:19	50	--	6
DDT 10% in dioxane	1:19	50	--	6

1/30-year-old material containing 66 percent of arsenious acid
but no cobalt.

Table 2.--Moths of the tobacco and the tomato hornworms attracted by the odors of various aromatic materials

Material	Days tested	Number of moths captured				Total
		<u>P. quinquemaculata</u>		<u>P. sexta</u>		
		Males	Females	Males	Females	
Ammonium benzoate <u>1</u> /	7	0	0	0	0	0
Ammonium salicylate	60	0	0	0	0	0
<u>iso</u> -Amyl acetate	7	0	0	1	0	1
Amyl alcohol	21	3	1	0	0	4
<u>iso</u> -Amyl alcohol:						
Lot 1	28	1	1	0	0	2
Lot 2	16	0	0	0	1	1
Amyl benzoate:						
Lot 1	232	68	53	95	51	267
Lot 2	56	8	7	16	7	38
<u>iso</u> -Amyl benzoate	125	20	21	47	21	109
<u>iso</u> -Amyl bromide	18	0	0	0	0	0
Amyl butyrate	161	23	19	18	10	70
<u>iso</u> -Amyl butyrate	160	18	15	23	13	69
<u>iso</u> -Amyl caproate	40	9	4	1	0	14
Amyl cinnamate	6	0	0	0	0	0
alpha-Amyl cinnamic aldehyde	4	0	0	0	0	0
Amylic alcohol	21	1	1	0	1	3
<u>iso</u> -Amyl ether	72	7	7	6	5	25
<u>n</u> -Amyl ether	18	0	0	0	0	0
Amyl formate	7	0	0	0	0	0
Amyl heptoate	8	0	0	0	0	0
Amyl nitrate	7	0	0	0	0	0
<u>iso</u> -Amyl nitrite	7	0	0	0	0	0
<u>p</u> -tert-Amylphenol	7	0	0	0	1	1
<u>n</u> -Amyl phthalate	8	0	0	0	0	0
Amyl propionate	17	0	0	3	0	3
<u>iso</u> -Amyl propionate:						
Lot 1	7	1	1	0	1	3
Lot 2	28	0	0	0	0	0
Amyl salicylate:						
Lot 1	56	18	21	25	12	76
Lot 2	98	37	27	25	12	101
Lot 3	39	35	28	20	10	93
<u>iso</u> -Amyl salicylate:						
Lot 1	348	152	136	101	60	449
Lot 2	134	42	45	21	15	123
Lot 3	80	54	37	7	19	117

Table 2.--(Continued)

Material	Days tested	Number of moths captured				Total
		<u>P. quinquemaculata</u>		<u>P. sexta</u>		
		Males	Females	Males	Females	

iso-Amyl salicylate--(Continued)

Lot 4	188	135	164	91	78	468
Lot 5	80	50	39	9	13	111
Lot 6	80	60	54	12	26	152
Lot 7	108	111	145	124	97	477
Lot 8	117	24	30	35	19	108
Lot 9	117	31	18	28	22	99
Lot 10	39	25	24	11	9	69
Lot 11	39	18	25	13	3	59
Lot 12	93	37	32	28	17	114
Lot 13	39	33	32	24	13	102
Lot 14	93	44	41	17	16	118
Lot 15	147	43	55	41	24	163
Lot 16	93	37	33	19	18	107
Lot 17	93	45	48	32	16	141
Lot 18	39	33	22	15	5	75
Lot 19	39	31	27	8	5	71
Lot 20	93	47	35	29	16	127
Lot 21	93	38	45	46	24	153
Lot 22	39	23	19	16	14	72
<u>iso-Amyl salicylate</u>						
from pure <u>iso-amyl</u>						
alcohol	54	2	9	2	3	16
<u>iso-Amyl salicylate</u>						
from coal gas	54	3	9	12	8	32
<u>iso-Amyl salicylate</u>						
fractions 2/:						
Cut 3, 120-130 C.,						
7 mm.	98	---	---	---	---	185
Cut 4, 130-138 C.,						
7 mm.	98	---	---	---	---	171
Cut 5, 136-146 C.,						
7 mm.	98	---	---	---	---	192
Cut 6, 140-145 C.,						
6-7 mm.	96	---	---	---	---	166
Residue	98	---	---	---	---	121
<u>iso-Amyl salicylate</u>	98	---	---	---	---	210
<u>iso-Amyl stearate</u>	18	0	0	0	0	0

Table 2.--(Continued)

Material	Days tested	Number of moths captured				Total
		<u>P. quinquemaculata</u>		<u>P. sexta</u>		
		Males	Females	Males	Females	
<u>iso</u> -Amyl <u>iso</u> -valerate	28	1	0	3	0	4
Amyl valerate	69	2	1	1	0	4
Benzyl acetate	7	1	0	1	0	2
Benzyl alcohol	347	52	37	96	28	213
Benzyl benzoate	184	22	19	13	9	63
Benzyl butyrate	196	25	27	45	17	114
Benzyl ether	7	0	0	1	0	1
Benzyl formate	61	3	1	1	2	7
Benzyl propionate	86	8	2	15	2	27
Benzyl salicylate	206	72	80	128	70	350
Benzyl valerate	56	3	3	3	1	10
<u>iso</u> -Butyl acetate	7	0	1	2	0	3
<u>iso</u> -Butyl alcohol	19	0	0	0	0	0
<u>n</u> -Butyl alcohol	19	0	0	0	0	0
<u>tert</u> -Butyl alcohol	21	1	0	0	0	1
Butyl benzoate	56	0	2	61	15	78
<u>iso</u> -Butyl benzoate	118	6	4	46	18	74
<u>n</u> -Butyl benzoate	125	17	14	130	57	218
<u>n</u> -Butyl <u>o</u> -benzylbenzoate	60	0	2	0	0	2
<u>n</u> -Butyl benzyl ether	82	2	5	2	1	10
Butyl butyrate	18	0	0	0	0	0
<u>iso</u> -Butyl butyrate	60	0	0	0	0	0
<u>iso</u> -Butyl <u>n</u> -butyrate	25	0	1	1	1	3
<u>iso</u> -Butyl <u>iso</u> -butyrate	8	0	0	0	0	0
<u>n</u> -Butyl ether	21	0	1	0	0	1
<u>n</u> -Butyl formate	7	0	0	0	0	0
<u>n</u> -Butyl levulinate	21	0	3	2	0	5
<u>n</u> -Butyl oleate	21	0	1	0	2	3
<u>iso</u> -Butyl propionate	17	0	0	0	0	0
Butyl carbinol	18	0	0	0	0	0
Butyl salicylate	23	0	1	3	5	9
<u>iso</u> -Butyl salicylate	37	1	1	2	2	6
<u>n</u> -Butyl salicylate	118	20	14	29	20	83
Butyl valerate	40	0	0	2	0	2
<u>iso</u> -Butyl valerate	14	0	0	0	0	0
<u>n</u> -Butyl <u>iso</u> -valerate	8	0	0	0	1	1
Caprylic alcohol	21	0	0	1	0	1
Decyllic alcohol	8	0	0	0	0	0
beta, beta'-Dehydroethyl ether	13	0	0	0	0	0

Table 2.--(Continued)

Material	Days tested	Number of moths captured				Total
		<u>P. quinquemaculata</u>		<u>P. sexta</u>		
		Males	Females	Males	Females	
Ethyl acetate	4	0	0	0	1	1
Ethyl benzoate	24	1	0	3	2	6
Ethyl benzyl alpha-toluidine	8	0	0	0	0	0
Ethyl <u>iso</u> -butyrate	8	0	0	0	0	0
Ethyl <u>n</u> -butyrate	21	0	0	0	0	0
Ethyl formate	4	0	0	0	0	0
Ethyl salicylate	4	0	0	0	0	0
Ethyl valerate	13	0	0	0	0	0
Ethyl <u>iso</u> -valerate	12	1	1	0	0	2
Formaldehyde	14	0	0	0	0	0
Furfuryl alcohol	18	0	0	0	0	0
Fusel oil benzoate	108	20	24	40	30	114
Fusel oil salicylate	14	0	0	4	1	5
Fusel oil salicylate fractions 2/:						
Cut 3, 140-157 C., 25-30 mm.	98	---	---	---	---	175
Cut 4, 118-142 C., 6-7 mm.	98	---	---	---	---	202
Cut 5, 142-146 C., 6-7 mm.	98	---	---	---	---	153
Cut 6, 143-147 C., 6-7 mm.	98	---	---	---	---	125
Residue	98	---	---	---	---	166
Jimsonweed (<u>Datura stramonium</u> L.) blossoms, alcohol extract	9	0	0	0	0	0
Jimsonweed blossoms, extracted in lard	8	0	0	0	0	0
Methyl acetate	67	0	0	0	0	0
Methyl benzoate						
Lot 1	58	0	0	12	5	17
Lot 2	54	2	3	9	11	25
Methyl salicylate	58	7	6	2	3	18
<u>iso</u> -Propyl alcohol	60	0	0	1	0	1
<u>n</u> -Propyl alcohol	60	1	0	0	0	1



Table 2.--(Continued)

Material	Days tested	Number of moths captured				Total
		<u>P. quinquemaculata</u>		<u>P. sexta</u>		
		Males	Females	Males	Females	
<u>iso</u> -Propyl benzoate	4	0	0	0	0	0
Propyl butyrate	8	0	0	0	0	0
<u>iso</u> -Propyl salicylate	4	0	0	0	0	0
<u>iso</u> -Valeraldehyde	18	0	0	0	0	0

1/All materials were obtained from commercial sources unless otherwise stated.

2/Prepared by the Division of Insecticide Investigations.